Chapter 6: Marking

Flipper Tags

If a turtle is encountered without flipper tags, apply two new flipper tags to the trailing edge of the rear flippers just proximal to the first scale. If this site is unsuitable (lesions, scars, missing flippers, etc.), locate an alternate site along the trailing edge of a suitable flipper (i.e., the trailing edge of the front flipper(s) in the second large scale distal to the axilla). Turtles larger than 30 cm SCL should receive flipper tags. Experienced taggers may be comfortable tagging smaller animals in some cases. Extra care should be taken when positioning the tag in smaller animals to allow room for growth. Check carefully for previous tagging scars on both front and rear flippers and note if present.

There may be circumstances where a previously applied tag will need to be removed prior to applying a new one. If a tag is damaged, covered in fouling organisms (e.g., barnacles) which cannot be removed, or appears to be in danger of coming off, this tag should be removed and replaced with a new tag. There may also be situations where a tag may be improperly placed (i.e., overgrown with tissue or tearing out), or in some way injurious to the animal. In these situations, the tag should be carefully removed and replaced at the discretion of the tagger if they feel that removal will not cause further injury. Generally, the tag can be removed using two pairs of pliers to uncrimp the tip, but wire or bolt cutters may be necessary occasionally. If a previously applied tag is removed, the identification number should be recorded if possible, and the tag should be reported to the original tagging project and the Cooperative Marine Turtle Tagging Project (CMTTP). Return the voided tag to the CMTTP whenever possible.

To apply self-piercing, self-locking Inconel alloy flipper tags (Figures 6-1 - 5):

Step 1: Remove a tag from the strip and record its identification number on the tagging form. Be careful not to bend the tag from its original shape. Only peel back enough tape on the strip to remove one or two tags at a time to prevent loss of remaining tags. Scrub all tags with hot, soapy water and wipe with or soak in alcohol prior to use to remove the oily residue present when shipped from manufacturer.

Step 2: Hold the applicator in one hand. With the pointed (piercing) side of the tag facing the depression in the jaws of the pliers, and with the side of the tag with the hole placed adjacent to the depression, place the end of your index finger of the other hand inside the tag against the bend. Pull the tag straight back into the open jaws of the applicator, aligning the point opposite the small depression in the jaws. A firm pull will be needed to

snap the tag completely into the correct position. Take care not to squeeze the applicator together before you are ready to tag the turtle or the tag will fall out. Swab the tag and applicator tips with 10% povidone-iodine.

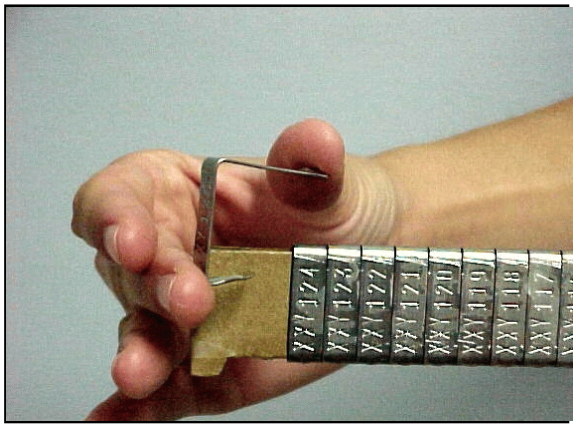


Figure 6-1. Remove cleaned tag from strip, record number, and disinfect (NMFS/SEFSC photo).

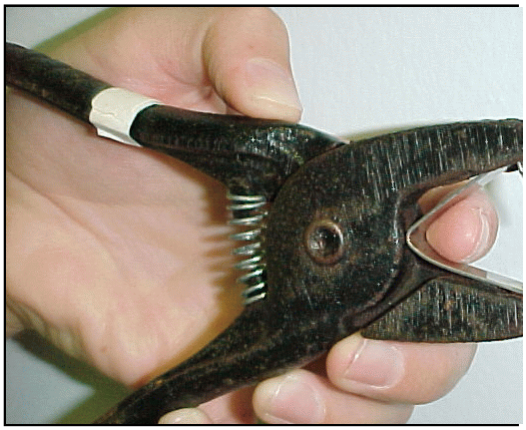


Figure 6-2. Firmly pull the tag with your index finger straight back into the open jaws of the applicator and swab tips of tag and applicator with 10% povidone-iodine (NMFS/SEFSC photo).

Step 3: Rear Flipper Tagging (preferred site): Locate the correct site to apply the tag (the trailing edge of the rear flipper just proximal to the first scale). Juvenile and subadult hardshell turtles can be placed on their carapace to facilitate access to the tagging site. If someone is available to help, they should hold the turtle and restrain the flipper so that it does not pull away while you clamp down on the tag. Be sure to position the tag so there will be adequate overhang (approximately 1/3 the length of the tag) after it is attached to the flipper.

Front Flipper Tagging: Place the turtle on its plastron and locate the correct site to apply the tag (the trailing edge of the front flipper in the second large scale distal to the axilla). If someone is available to help, they should hold the turtle and restrain the flipper so that it does not pull away while you are clamping down on the tag. Be sure to position the tag so there will be adequate overhang (approximately 1/3 the length of the tag) after it is attached to the flipper.

Step 4: Swab the tagging area with 10% povidone-iodine. Apply the tag by squeezing the applicator together in a firm, steady manner. The tag point will pierce the flipper and lock into place with the tip bending securely over the opposite side like a staple point. Squeeze the applicator together with some force in order to fully lock the tag; it may be helpful to use both

hands. If the tag does not lock, grasp it once again with the pliers and apply more pressure. You can use the tips of the pliers to pinch down on the end of the tag's tip passing through the hole to ensure that the tip is securely locked. If you cannot get the tag to lock, remove it and apply another tag to the same flipper. A tag that is not applied properly will be shed quickly.

Figure 6-3: Apply an inconel tag to the rear flipper of a loggerhead turtle (NMFS/SEFSC photo).

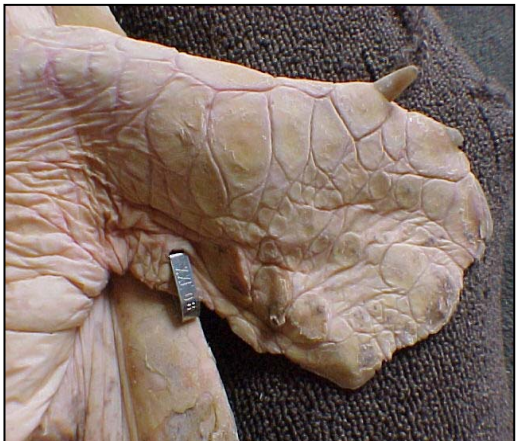


Figure 6-4. Inconel tag applied to the rear flipper of a sea turtle (NMFS/SEFSC photo).

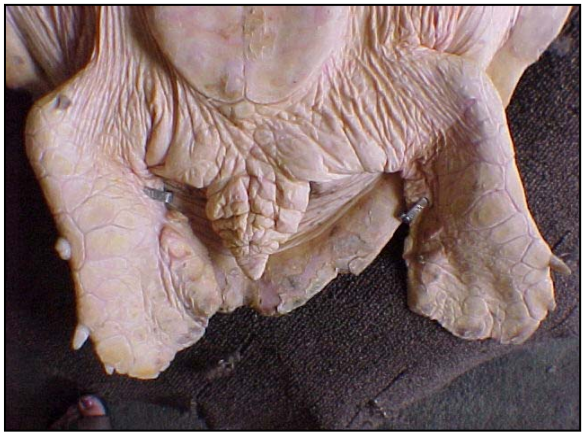


Figure 6-5. Apply second rear flipper tag (NMFS/SEFSC photo).

Step 5: Repeat the entire procedure and apply a second tag at the same site on the other flipper. All turtles should be double tagged in this manner using consecutive tag numbers whenever possible. If a tag is damaged for any reason, please record this information on the tagging form and return the damaged tag. If the recommended tagging site has been injured or is unsuitable for tag application, use an alternate site along the trailing edge of the flipper.

PIT Tags

Scanning Protocol

It is imperative that all species encountered are checked for PIT tags. Rarely, a turtle may have more than one PIT tag. PIT tag scanners generally are capable of reading frequencies of 125 kHz, 128 kHz, 134.2 kHz, and/or 400 kHz. Researchers should not use AVID encrypted tags; these encrypted tags can only be read by AVID readers, which are not widely in use by researchers in the field.

1. Keep the PIT tag scanner inside a plastic sealed bag at all times during use to prevent it from getting wet. Scan a sample tag to verify that the batteries are good, and that the PIT tag reader is working properly. The button on the scanner needs to be continuously depressed throughout the scanning process. It is scanning properly when the screen display says “WORKING” or something similar.

2. Place the PIT tag scanner directly on the turtle’s skin surface; for leatherbacks you will likely have to press hard into the skin with the reader as the tag likely is very deep. For hardshell turtles, slowly scan the dorsal surface of both front flippers, the shoulder and neck areas, and rear flippers (Figure 6-6). Attempt to scan the ventral surfaces of all four flippers, the “armpit”, neck and ventral areas (small turtles can be turned over), as some projects tag in the rear flippers or other locations. For leatherbacks, scan the dorsal musculature of both forelimbs and the top of the neck (Figure 6-7). It is important to slowly move the scanner multiple times, allowing it to cycle through different tag frequencies to avoid missing a tag.

3. If a PIT tag is detected, record the identification code exactly as it appears on the scanner display, including any hyphens that may appear as part of the code. ID codes usually are hexadecimal (digits 0-9 and letters A-F) and are generally 10 bytes (125, 128, or 400 kHz tags) or 15 bytes (134.2 kHz tags) long. Double check to make sure you have recorded the ID code exactly as it appears on the reader display. Please be especially careful with letters and numbers that easily are confused, such as the letter O and the number Ø. Record all tag IDs (there

could be more than one PIT tag). If the scanner display reads "AVID" or the ID reads inconsistently, you may have detected an encrypted AVID tag. Encrypted tags may display a 16 byte alphanumeric code (0-9 and A-Z) on non-AVID reader displays. Record what you see on the viewer and insert a new PIT tag in the opposite shoulder/flipper.

Figure 6-6. Scanning for internal PIT tags (NMFS/SEFSC photo).

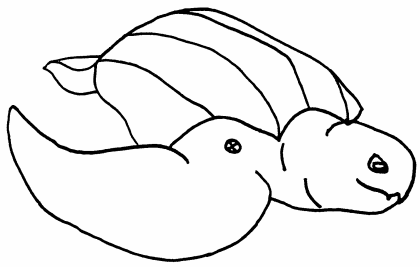


Figure 6-7. Leatherback turtles may have been PIT tagged in the dorsal musculature (NMFS/SWFSC diagram).

4. Wipe off the plastic bag. If a tag ID code remains on the display, press the scanner button again until it reads "no tag found;" this will cause the reader to shut off more quickly, extending the battery life. The PIT tag scanner automatically turns itself off. When not in the field, store the unit with the plastic bag open so that humidity does not accumulate and damage the unit. Replace or recharge batteries as needed, and do not store the unit for long periods with the batteries installed.

Application Protocol

Determine a PIT tag is not already present by using a PIT tag scanner. Turtles larger than 30 cm SCL should receive PIT tags. In some cases, experienced taggers may feel comfortable tagging smaller turtles in the triceps superficialis muscle. The tag should occupy less than 20% of the muscle's total volume and 1/5 of its length, and should not be located near the ends of the muscle. To determine if a small turtle should be tagged in the triceps superficialis, pinch the muscle forward (Figure 6-8) and assess the tag size relative to the muscle size.

1. Scan the PIT tag before opening the package to ensure that it is a functional tag. Double check that the number on the display matches that on the label.

2. Record the PIT tag number on the datasheet and peel off the self-adhesive label on the PIT tag package, if available, and attach it to the datasheet.

3. Remove the loaded needle from the sterile wrapper and insert it into the injector or the preloaded syringe and needle, taking care not to depress the plunger.

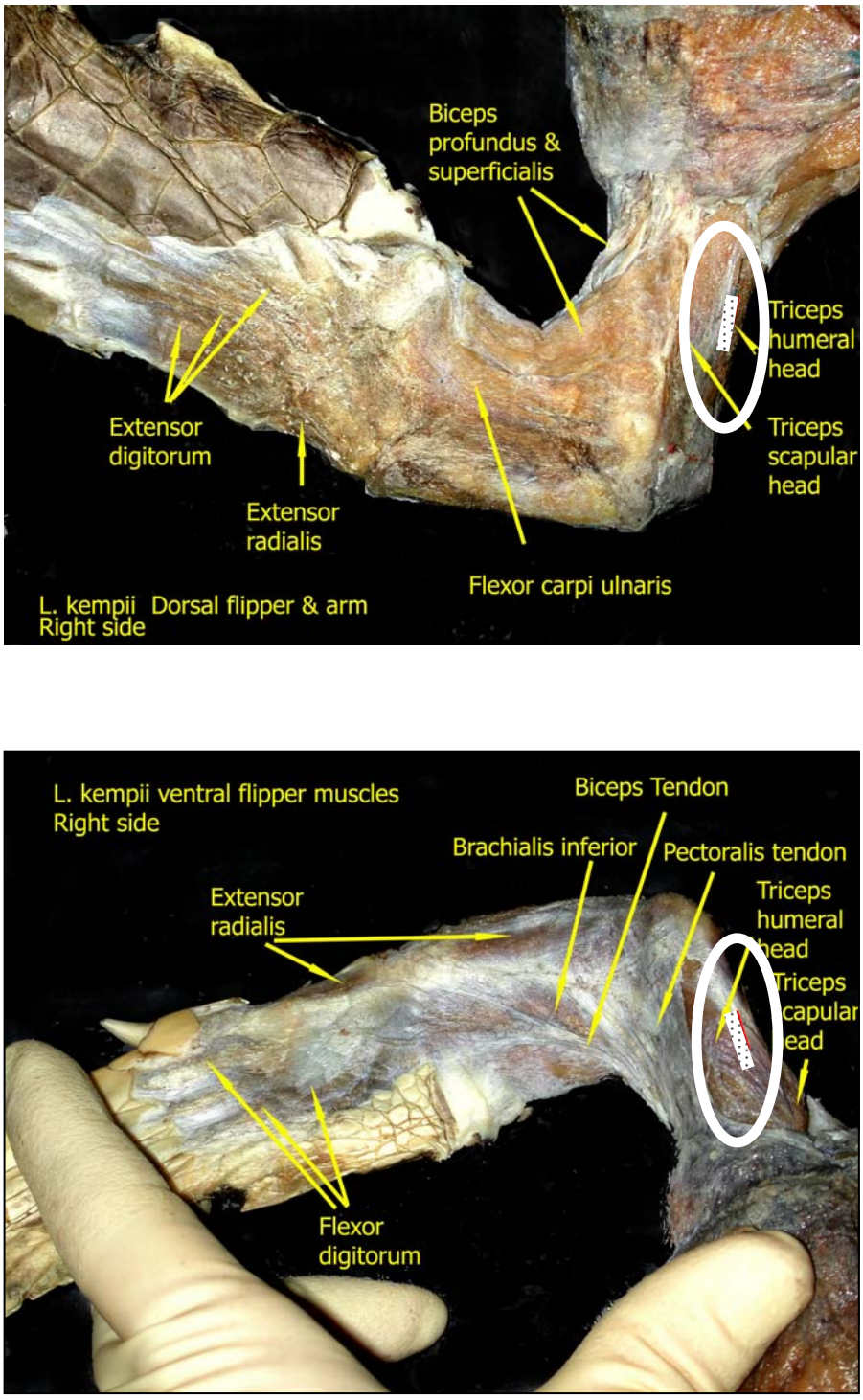
4. Swab the PIT tag injection location and the end of the injector with 10% povidone-iodine.

5. Place the tag into musculature, where it will become encapsulated. Leatherbacks are tagged in the center of the dorsal musculature of the forelimb (Figure 6-7); insert the entire needle perpendicular to the skin. (Note: The preferable site for leatherbacks is the right forelimb, as some beach research projects only scan the right side). Hardshell turtles should be tagged in the triceps superficialis muscle (Figures 6-8 - 9); pierce the skin of the flipper with the needle and insert the entire needle parallel to the surface just under the skin and into the muscle. Slide the plunger forward. (Note: The preferable site for Kemp's ridleys is the left triceps superficialis muscle to maximize the chances of tag detection, as the nesting project in Rancho Nuevo scans the left front flipper).

6. Put your thumb over the injection site and apply pressure while carefully removing the needle. Dispose of the needle in a sharps container. If the injection site bleeds, swab it with 10% povidone-iodine and apply pressure until the bleeding stops.

7. Scan the flipper for the PIT tag to ensure that it is functioning in the turtle.

Figure 6-8. Inserting PIT tag into the triceps superficialis muscle (NMFS/SEFSC photo).



Figures 6-9a and b. PIT tag placement (white line) shown in dorsal view (top) and ventral view (bottom) of a dissected Kemp's ridley flipper (Photos and annotations by J. Wyneken, Florida Atlantic University).